Xjenza Online - Science Journal of the Malta Chamber of Scientists
www.xjenza.org
DOI: 10.7423/XJENZA.2020.2.01

Research Article

Mask-wearing during the Covid-19 pandemic in the Maltese context: attitudes, beliefs, perceptions and behaviour

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Abstract. The efficacy of any public health campaign is impacted in important ways by the level of public understanding and cooperation. The measures put in place to limit the spread of SARS-CoV-2 virus in Malta have had important influence on societal relations, with the use of face coverings arguably having the most impact. The aim of our study was to empirically explore the lived experience of wearing a mask - the perceptions, beliefs and attitudes related to the use of face- coverings during the COVID-19 pandemic in the Maltese Islands. A mixed methods research design was used to collect data via an online survey with a convenience, non-probability sample made up of 990 respondents. Quantitative data were collected via closed ended questions supplemented by qualitative data in open text boxes. Our data, collected before the wearing of face coverings was mandatory in all public places, showed how the vast majority of participants chose to wear them, with the predominant choice being facemasks. The vast majority of respondents claimed that the wearing of face masks while interacting in public spaces (both indoor and outdoor) leads to a sense of security, with increased sense of confidence in public safety measures. Data on beliefs and knowledge are significantly associated with level of education and include the mistaken belief that a visor offers as much protection as a facemask, and that wearing a facemask reduces the amount of oxygen available to breathe. Qualitative data highlighted challenges linked to communication, heat, discomfort, anxiety about lack of oxygen, and finding it harder to breathe, besides issues related to condensation on spectacles. The negative impact at work was also flagged, with increased level of irritability, reduced levels of concentration and reduced quality of service described in the data. Though compliance to public health directives was clearly dominant within our sample, the particular challenges highlighted within the study identify areas of potential breakdown of safe practices where focused science communication on a national level would be beneficial.

Keywords: Facemasks, Malta, Covid-19, pandemic, attitudes, beliefs, perceptions, behaviours

Acknowledgements. We are grateful to the reviewers for their constructive comments and suggestions. We also thank Dr Tanya Melillo from the Infectious Disease Prevention and Control Unit, Malta for her feedback on the questionnaire.

1 Introduction

On the 7th of March 2020 Malta recorded its first case of COVID-19, a 12-year-old girl who had returned to Malta from Italy on the 3rd of March developed symptoms and tested positive for SARS-CoV-2 (The Times of Malta, 2020, Mar 7). Within 5 days from the first case, on the 13th of March, all schools and educational facilities were closed by the Government in an effort to contain the spread of the virus. Just over a month later, Malta had its first Covid-19 victim with the first Covid-19 related death recorded on the 8th of April.

Some general population data within the Maltese context is necessary in order to put the rate of local spread of Covid-19 into perspective. Recent data show that the total population based on normal conditions of residence on the Maltese Islands was 514 564 at the end of 2019. The total land area for the islands is 315 kilometers squared, with a population density of 1633 persons per square kilometre (National Statistics Office, Malta, 2020). This makes Malta by far the most densely pop-

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ulated nation state within the EU where the average (EU27 from 2020) is 109 per square kilometre (Eurostat, 2020a). Added to this dense and vibrant predominantly urban local context is the impact of the highest tourism intensity in the EU, with 21 guest nights per inhabitant (Eurostat, 2020b).

During the first wave of SARS-CoV-2 infections (March-April-May), despite a palpable increase in anxiety levels (Grech et al., 2020), the general perception on the islands was that the Superintendence for Public Health was handling the pandemic adequately, considering that the country was recording below average active cases and deaths, when compared to the rest of Europe. There were various processes at play here, including the announcement of a public health emergency, the closing of our airport to nonessential flights, and the implementation and enforcement of strict social distancing measures which restricted people from meeting up in groups and also through the closure of most leisure, sports and recreational facilities including restaurants, bars, hairdressers, hotels, pools, open-air markets, churches and several health services such as physiotherapy and immunisation clinics. As the number of active cases became smaller, all of the services were allowed to reopen as announced on the 22nd of May 2020.

The Prime Minister, on the 14th of June, declared that the public health emergency was to be lifted and that by the 15th of July "all Legal Notices enacted in this regard will be removed" (The Malta Independent, 2020, Jun 14), however the Public Health preventive campaign continued. Although mask-wearing was not mandatory, the Superintendence of Public Health started to urge the public to wear masks. The Archdiocese of Malta made the wearing of face coverings in church mandatory as soon as churches were allowed to open to the public on the 13th of June 2020.

On the 1st of July, with a minimal number of active cases in Malta, all Covid-19 preventive measures were lifted. The Archdiocese of Malta also announced that the wearing of masks during mass shall not remain mandatory. On the 20th of July 2020 Malta had a mere four active cases, which is the smallest recorded number of active cases in one day since the start of the first wave of Covid-19 in Malta.

The relaxing of measures was quickly followed by an increase in cases, particularly after commercial flights to and from Malta resumed on the 1st of July, and the strict social distancing rules were abandoned, most pertinently in nightlife hotspots such as Paceville. Henceforth, by the beginning of August, the rates of new cases of COVID-19 started to increase, and public health restrictions followed suit. The country gradually started to make the use of masks mandatory, at first by obliging the public to wear masks when receiving or giving a service in enclosed spaces such as supermarkets, retail shops, shopping malls and hospitals. As of the 8th of August 2020, a fine of €50 was imposed on those who did not comply with mask-wearing regulations. On the same day during two separate press conferences, Prime Minister Abela, Health Minister Fearne and Superintendent Gauci all wore masks, with the latter two officials keeping it on whilst addressing the press. Although the legal notice with regards to face coverings solely referred to masks, the press raised a question to the spokesperson of the Ministry for Health about whether the wearing of visors without a mask was lawful or not. The spokesperson for the Ministry confirmed that Malta's Face Covering Legal Notice includes visors despite the legal notice only referring to masks. A few days later, on the 11th of August, the Superintendent of Public Health, Professor Charmaine Gauci confirmed, during her regular press meeting on national television, that the legal notice is to be amended to include visors as well as masks.

On the 19th of August, mask restrictions were further tightened as the wearing of masks became mandatory in all closed public spaces, with the exception of restaurants whilst seated. On the same day the operation of all bars and nightclubs was halted until further notice.

The rates of new cases continued to rise and, during the period of data collection for this research, a new record was recorded on the 16th of September, with 106 new cases (COVID-19 Public Health Response Team (Malta), 2020). Breaching 100 new cases in a day was a significant milestone in the public imaginary.[1] On the 18th of September the Superintendent of Public Health encouraged the public to wear masks at all places and times, except when at home. The Malta Chamber of Commerce had proposed mandatory mask-wearing in all places outside homes on the previous day.

After data collection for this research had been finalised, the government of Malta made mask-wearing mandatory in all public spaces, indoor and outdoor, including offices. The government announced that this regulation would be enforced as of the 23rd of October 2020 and individuals who do not comply would have to face a fine of €50, or €100 if not paid immediately.

Once again, although the government constantly refers to masks, visors are not excluded from the law and thus members of the public who choose to wear a visor without a mask would not be breaking the law. Nonetheless, the local public health authorities have recommended the use of face-masks as opposed to visors, directly claiming that the latter type of face-covering

[1] Similar milestones occurred on 17th October 2020 with 204 new cases, and 2nd March 2021 with 336 new cases. Most significant was the highest number of new cases recorded in 24 hours to date of publication which was 510 on 10th April, 2021 (COVID-19 Public Health Response Team (Malta), 2020).

is not as effective as the former. On Wednesday 11th November, Minister for Health Chris Fearne declared on national television that whilst masks are more effective than visors, the wearing of visors without a mask underneath remains lawful for the benefit of those who simply cannot cope with a mask on.

This dynamic flow of information and recommendations from Public Health and Government officials and institutions affects the general public in important ways, and has a direct impact on the effectiveness of public health campaigns. This paper sets out to highlight some societal elements at play. It draws on empirical data to offer exploratory engagement with the beliefs, attitudes and lived experiences related to the wearing of face coverings in the Maltese local context.

2 Literature Review

The World Health Organisation (WHO) initially emphasised the respiratory droplet infection route as the key mode of transmission of SARS-CoV-2 (World Health Organisation, 2020). The possibility of it also being airborne and spread via aerosols has been the source of much debate with early researchers claiming that experts can't agree on the matter (Lewis, 2020, pp. 1). A study by Lednicky et al. (2020), which was published in August, revealed that Sars-Cov-2 virus could be detected in the air up to 4.8 meters away from infected patients. The Lancet for Respiratory Medicine published an editorial in October 2020 highlighting the growing evidence for airborne infection, stating that "infective microdroplets are small enough to remain suspended in the air and expose individuals at distances beyond 2 m[eters] from an infected person" (The lancet respiratory medicine: Editorial, 2020). In tune with this new evidence, WHO updated their website in October 2020 to state that "aerosol transmission can occur in specific settings, particularly in indoor, crowded and inadequately ventilated spaces, where infected person(s) spend long periods of time with others, such as restaurants, choir practices, fitness classes, nightclubs, offices and/or places of worship" (World Health Organisation, 2020).

The beneficial impact of face coverings is clearly supported by research with one study concluding that "wearing a surgical mask or a KN95 respirator significantly reduced the outward number of particles emitted per second of breathing" (Asadi et al., 2020, pp. 5). Wearing masks helps with preventing the spread of Covid-19 because it drastically decreases the spread of droplets and viruses in exhaled breath (Leung et al., 2020). It is also apparent, however, that the science supporting the efficacy of face masks to control the spread of SARS-CoV-2 is not clear cut - not least because the wearing of facemasks is a behavioural variable. They are worn by people who choose different qualities of mask (surgical, fabric, KN95 etc), worn with different levels of adherence to best practice related to use, reuse, disposal and washing. Individuals' beliefs and attitudes are central to the process, indeed it has been claimed that "[h]uman behaviour is core to how well masks work in the real world" (Peeples, 2020, pp. 188).

Focusing on the societal context when exploring the wearing of face coverings has led to some interesting findings. It has been found that men are more likely to be non-compliant when it comes to face-covering regulations (Okten et al., 2020). Gender not only impacts behaviours but it also seems to impact perceptions towards mask-wearing. Men are more likely to perceive face-masks as a deprivation of their control and independence, whilst women are more likely to build their perceptions towards face-masks based levels of comfort, or the lack of it (Howard, 2020).

This finding resonates with pre-Covid-19 literature which shows that men have a tendency to be risk-takers with the aim of portraying a strong and courageous image. In fact, men are typically less likely to adopt preventive measures such as taking vaccines, but more likely to act dangerously through actions such as speed driving (Byrnes et al., 1999; Harris et al., 2006). A 2016 review declared that women were 50% more likely to engage in preventive measures, such as proper and frequent hand-washing, cleaning of surfaces and mask-wearing, in case of an epidemic such as influenza (Moran et al., 2016).

These findings suggest that mask-wearing campaigns would benefit from factoring in gender related behavioural differences. The importance of enforced regulations which leave everyone with no other option but to comply have also been flagged since the effectiveness of masks is largely dependent on compliance (Eikenberry et al., 2020). Research shows that policies which make the wearing of masks mandatory are a prerequisite to ensuring that the best outcomes are achieved (Betsch et al., 2020). Compliance is socially praised whereas not complying is perceived as deviant behaviour which is negatively sanctioned or "socially punished" (Betsch et al., 2020, pp. 2).

The efficacy of any public health campaign is impacted in important ways by the level of public understanding and cooperation. The measures put in place to limit the spread of SARS-CoV-2 virus in Malta have had important influence on societal relations, with the use of face coverings arguably having the most impact. The aim of our study is to empirically explore the lived experience of wearing a mask—the perceptions, beliefs and attitudes related to the use of face-coverings during the COVID-19 pandemic in the Maltese Islands.

3 Research Design

A mixed-methods research design was used, collecting quantitative and qualitative data via an online survey. The decision to collect quantitative and qualitative data via the same research tool, rather than sequentially using preliminary qualitative focus groups, was due to the urgency of the topic and time and human resources restrictions.

The research population for this study was the general public in the Maltese Islands. A convenience sample was created by inviting local Facebook users to participate via an active link to a google forms questionnaire. This was widely posted using personal contacts of the researchers and also (with permission) on popular closed Facebook groups. The urgency to collect data within a fluid and fast changing scenario led to this sampling strategy. Though it comes with intrinsic limitations related to the necessity of IT literacy and material (hardware) resources required to participate, framing the sample within the community of local Facebook users does offer a useful 'contingent window' (Candea, 2007) onto the situation in the local context.

The data collection for this research was carried out over a span of 11 days, from the 8th until the 18th of September 2020. A total of 990 responses were collected with a minimal amount of these responses being incomplete. Table 1 shows the profiles of the respondents. A self-assessment of vulnerability to COVID-19 resulted in 20.5% of respondents stating that they were in the 'vulnerable' category for COVID-19, while 66.7% said they were not, and 12.8% stated that they did not know.

It is important to flag that any claims to knowledge or understanding we make are limited to the population from which this sample was drawn—individuals with active Facebook accounts, resident in Malta. Tallies have been left unweighted with respect to gender, age or education as these, in themselves, are interesting data and reflect the gendered activity within the social media landscape and the social profile of individuals engaged in debates related to health and wellness on the web.

3.1 Survey Design

The survey was created and administered using google forms, in conformity with the University of Malta Research Ethics Committee (UREC) research ethics review procedure. All data are anonymous, with no identifiers collected. The introductory section on the survey offered a synopsis of the research aim, the institutional affiliation and contact details of the researchers, the rights of respondents, and a declaration that respondent was over 18 years of age.

The survey was organised under general themes of: Demographic data, Attitudes, Knowledge and Beliefs, Choices and behaviour. The survey was fielded in the English language, however respondents were given the option to use Maltese in the open-ended, qualitative responses. The vast majority of the questions were closed-ended, however participants had the option to add qualitative details in open-ended supplementary items. There was a good uptake in this respect.

The survey was piloted with a convenience sample of 13 to test for content validity, and it was also reviewed by a senior member of the Infectious Disease Prevention and Control Unit in order to identify any gaps in targeted data. Feedback led to further refinement and additions to the questionnaire, and the eventual final version had 45 questions, taking 15–20 minutes to complete.

Quantitative data were analysed using SPSS, whereas qualitative data were analysed thematically after manually identifying codes in the data which were colour coded and then sorted into overarching themes within Excel. The chi-squared test was the main statistical test used, because the main interest was in comparing responses across gender, age, and education level. A correction for multiple testing was not deemed necessary since we mainly considered each test individually. In all analysis, we consider a p-value of 0.05 or less to be significant. In all chi-squared tests used for comparing responses across gender, the expected values in each cell were in the accepted range so the results of the test are not considerably affected by the difference in numbers for males and females, even though a proportion more representative of the actual population would have been preferred.

This paper will highlight the key findings in the quantitative data while drawing on some of the key themes in the qualitative data.

4 Results and Discussion

4.1 Behaviour

When asked about wearing face coverings, even though not mandatory by law at time of data collection, almost all stated that they wear a face mask as directed by the Superintendent for Public Health: 96.7% of respondents replied they always do, 2.8% replied sometimes and 0.5% said they never did. This finding is to be interpreted within the limitations of the sample, and is not surprising as individuals taking up the invitation to participate in the survey would very probably be positively engaged in public health endeavours. Also expected is the finding that 99% of all respondents who self-identified as vulnerable to COVID-19 stated that they always wear masks.

The majority of respondents who sometimes or never wear masks as directed by Public Health opted to contribute qualitative data to expand on their response, with the majority of these (55%) flagging cynicism and

		No. of respondents	Percentage
Age	18-24	65	6.6
	25-34	173	17.5
	35-44	265	26.8
	45-54	234	23.7
	55-64	190	19.2
	65-74	56	5.7
	75+	5	.5
Gender	Female	777	78.7
	Male	210	21.3
Level of Education	Post-secondary (sixth form)	232	23.5
	Primary/ Secondary	135	13.7
	Tertiary	619	62.8

Table 1: Profile of respondents

disbelief in the usefulness of wearing masks, followed by 32% who claimed they were uncomfortable and that it was too hot to wear one. Other reasons flagged for not wearing a mask were the problems with communication that they cause, or the fact that "*they are horrible and take away freedom*". Interestingly, gender did not have a significant impact on these responses, however this is to be interpreted with caution and within the limitations of the opt-in recruitment technique for the survey.

4.2 Perceptions

When asked how they feel about people around them wearing face masks, 94% of respondents claimed they felt more comfortable when face masks are worn in enclosed public spaces, with this percentage going down to 79% in outdoor public spaces. There is a significant difference here, $\chi^2(1, N = 978) = 91.73$, $p < 0.001$.

Thematic analysis of the qualitative data gathered in this section led to three overarching themes : Feeling safer and protected; Respect for laws and regulations; Reciprocity in care. Out of the respondents who said that they feel more comfortable with people working in public space wearing masks, 82% of open ended responses mentioned feeling safer and more protected, believing there was less risk of infection, with participants describing how they "*feel reassured that the shop is implementing [safety] measures*" which leads them to "*feel[ing] secure and know[ing] that the place is following all protocols*". 10% mention that it is a reassuring sign of respect for law and regulations, with 8% flagging reciprocal care and social responsibility – "*because they would be respecting me just like I would be respecting them*", and "*I feel they show commitment to the well-being of the community*".

The majority of those who responded that they were indifferent expressed cynical beliefs on the efficacy of wearing masks, with some individuals questioning the very existence of the pandemic. 35% of these were cynical about the usefulness of wearing a mask in the first place. They pointed out that they were ineffective because people do not wear them correctly, don't change or wash them, with some going as far as questioning the need for them "*because I don't believe there is a pandemic*". Some describe feelings of frustration, and being "*fed up*" surrounded by people in masks: "*I don't like them they freak me out to wear them . . . because it keeps me and people safe. . . but really don't like them*". The respondents who expanded on why they feel less comfortable when people working in public areas wear masks described how "*it is just wrong*", "*ridiculous*", with one going as far as saying it is "*as if we are dogs that bite*". One key theme that emerged in the qualitative data is cynicism about the efficacy of wearing masks "*because I think it does more harm than good, it increases carbon dioxide which is harmful for the wearer*". Some refer to physical effects of wearing masks, claiming that they decrease the quality of communication ("*cannot hear voices*", "*cannot see half the face*").

When asked about how one feels about other persons wearing the mask incorrectly, i.e. under the nose, the responses in table 2 were obtained.

Interestingly, the main feeling is annoyed and this is consistent across gender, age and level of education with no significant differences between groups. When considering vulnerability there is a significant difference,

	Frequency	Percentage
Annoyed — it shows lack of concern for others	699	71.2
Anxious — it puts me at risk as the mask is not effective worn that way	229	23.3
Fine — it works well worn that way	9	.9
Indifferent — I don't care about they way people wear masks	45	4.6

Table 2: Q43: How do you feel when people around you are wearing their mask under their nose?

$\chi^2(6, N = 975) = 22.75$, $p = 0.001$, and those who are vulnerable are more anxious, as expected, than the other two groups.

4.3 Beliefs

When asked about the protection offered by visors, the majority (68.7%) believe that it offers less protection than a mask, 13.4% believe it offers the same amount of protection, 15.3% were unsure while 2.5% believe the visor offers more protection. There is a significant difference, $\chi^2(3, N = 984) = 10.61$, $p = 0.014$, between male and female respondents here, with more men believing it offers less protection (70.3%), and more women being unsure (17% as opposed to 10% in males) The table below shows how the different age groups answered. Again the difference is significant, $\chi^2(18, N = 985) = 10.61$, $p = 0.013$.

In table 4, one can see that the highest percentage of those who believe the visor is less effective is in the 25–44 age bracket, while the lowest percentage is in the 65–74 age bracket, and in this age bracket 23.3% believe the visor offers the same amount of protection as a mask. It is important to note that, as previously mentioned, it was only towards the end of October (after data collection), that the health authorities publicly stated that masks are more effective than visors, and strongly recommended the use of masks rather than visors.

When asked about the effect of wearing a mask on the amount of oxygen breathed in, 47% think it has no effect, 24% answered maybe while 29% think it has an effect. Comparing the responses by gender, we see there is a significant difference, $\chi^2(2, N = 983) = 11.528$, $p = 0.003$, with 57% of men saying it has no effect as compared to 44% of women.

This gender difference is to be considered with caution and in tandem with data on education where there is also a significant difference, $\chi^2(4, N = 982) = 24.73$, $p < 0.001$, in responses when comparing levels of education. As one can see in table 5, the percentage of those who believe the mask has no impact on oxygen levels is much higher in the category of those who have tertiary education. It is important to flag that the level of education within our non-probability sample is not equal across genders, with 76% of male respondents having a tertiary level of education compared to 59% of female respondents.

4.4 Lived Experience of Wearing a Mask

Participants were also invited to reflect on their experience of day-to-day living with masks due to the pandemic. When asked whether they feel that it is harder to breathe with a mask on 39.3% of those who responded said yes, 35.8% said in certain situations, while 24.9% said no. Again there is a significant difference in responses when comparing gender, $\chi^2(2, N = 985) = 17.17$, $p < 0.001$, with 42% of women saying it is harder to breathe as compared to 31% of men. When comparing across ages within the female gender, we also see some interesting differences (table 6), $\chi^2(12, N = 986) = 27.92$, $p = 0.006$.

In the age group 55–64, a significantly larger percentage feel that it is harder to breathe with a mask compared to the other age groups.

Thematic analysis of the qualitative data offered in this section led to identification of 11 themes as itemised in table 7. The qualitative responses ($n = 416$) to Q30 were predominantly (39% of responses) focused on the issue of coping with the masks in excessive heat. This is unsurprising given the local climatic context at the time of data collection with peak daytime temperatures ranging from 24 to 27 degrees celsius.

The second most frequent situation flagged by respondents was that of exercise, with 26% of responses mentioning the difficulty they have in breathing with a mask during recreational exercise (walking, running, dancing), quotidian exertion (climbing stairs, walking fast), or work related physical activity. More interesting is the third situation flagged for creating challenges related to mask wearing. This is the reference to wearing masks in small, enclosed spaces, at 11% of responses for this question, with some participants specifically mentioning buses, planes, lifts and small rooms in their responses. The key issue in these cases, seems to be the feeling of "*lack of air*" due to poor ventilation, where "*oxygen is already limited as is*", where this feeling of "*not enough air*" makes it harder to breathe while wearing a mask. This finding is particularly interesting and relevant to understanding non-compliance with public

		Q43			
		Annoyed	Anxious	Fine	Indifferent
I am vulnerable to COVID-19	Don't know	69.4%	28.2%		2.4%
	No	73.5%	19.6%	1.2%	5.7%
	Yes	64.9%	32.7%	0.5%	2.0%

Table 3: Self-assessed vulnerability to COVID-19 cross-tabulated with Q43: "How do you feel when people around you are wearing their mask under their nose?"

		Q17				
		No, a visor provides less protection	No, a visor provides more protection	Not sure	Yes, the same	Total
Age	18–24	60.0%	7.7%	16.9%	15.4%	100.0%
	25–34	62.8%	3.5%	16.9%	16.9%	100.0%
	35–44	73.2%	2.6%	15.5%	8.7%	100.0%
	45–54	74.7%	1.7%	14.2%	9.4%	100.0%
	55–64	66.1%	0.5%	14.8%	18.5%	100.0%
	65–74	58.9%	3.6%	14.3%	23.2%	100.0%
	75+	80.0%		20.0%		100.0%
	Total	68.7%	2.5%	15.3%	13.4%	100.0%

Table 4: Q17: Do you believe that wearing a visor (without a mask) offers the same amount of protection TO THE PERSON WEARING IT as wearing a face mask?

		Q18		
		Maybe	No	Yes
Level of education	Post-Secondary (6th form)	26.0%	39.0%	35.1%
	Primary/ Secondary	33.6%	34.3%	32.1%
	Tertiary	20.9%	52.7%	26.4%
	Total	23.8%	46.9%	29.2%

Table 5: Level of Education cross-tabulated with Q18: Do you believe that wearing a mask has an impact on the amount of oxygen you breathe in?

		Q29			
		In certain situations	No	Yes	Total
Age	18-24	33.3%	28.2%	38.5%	100.0%
	25-34	39.2%	23.3%	37.5%	100.0%
	35-44	42.5%	18.4%	39.2%	100.0%
	45-54	35.4%	20.7%	43.9%	100.0%
	55-64	28.5%	21.5%	50.0%	100.0%
	65-74	37.8%	35.6%	26.7%	100.0%
	75+		66.7%	33.3%	100.0%
	Total	36.4%	22.1%	41.5%	100.0%

Table 6: Female respondents by age cross tabulated with Q29: Do you feel that it is harder to breathe with a mask on?

Q30	Frequency of code	%
heat	164	39.4
exercise/ manual work/exertion (stairs)	110	26.4
enclosed areas	45	10.8
length of time	40	9.6
stress at work	12	2.9
other	10	2.4
inflamed sinuses /asthma	10	2.4
wearing specs	8	1.9
anxiety/dizzy	6	1.4
talking	6	1.4
hairdresser	3	0.7
hot flushes	2	0.5
Total	416	100.00

Table 7: Qualitative data from Q30: In which situations is it harder to breathe with a mask on?

health directives on mask wearing, as this sense of lack of air in small enclosed spaces may pose particularly high risk for transmission of the Coronavirus COVID-19.

A further 10% of the responses to this question described how they felt it was harder to breathe with a mask on in situations when they had to wear them for long periods. Other reasons given for feeling it was harder to breathe with masks on included being stressed at work (3% of responses), health issues such as anxiety, asthma, inflamed sinuses (4%), hot flushes due to the menopause (0.5%), talking (1.4%) or sitting at the hairdresser (0.7%).

4.5 Communication

When asked about the effect of wearing a mask on communicating with others, 31% said it makes it harder to communicate, 59% said it sometimes makes it harder, while 10% said it doesn't make it more difficult. Here there is a significant difference in the response pattern when comparing across age groups, $\chi^2(12, N = 987) = 31.36$, $p = 0.002$, where those over 65 seemingly finding more difficulty (72% think it is always or sometimes more difficult to communicate with a mask on, while 28% think it is not a problem). Thematic analysis of qualitative data related to problems with communication due to use of facemasks resulted in the identification of seven key themes as itemised in table 8. The main problems with communication while using facemasks are related to the impact they have on vocal language communication. Some respondents drew attention to the end result with 13% highlighting the key frustration of not being understood or not understanding others. The majority (49%) of the responses to this question ($n = 953$) flagged issues related to the processes involved, with reduced voice projection and clarity of speech being the main problem with repeated reference to sound of voices being muffled and the problematic interference of other background noise.

Interesting detail was offered by seven respondents who explained that this was particularly problematic when they were speaking a language that was not their mother tongue — "*certain words come out mumbled*" and "*accents not being clear*" add to the general challenges in communicating while wearing facemasks.

Another dominant theme within the qualitative data offered in this section relates to the negative impact on effective communication linked to the inability to lip read. 16% of the descriptions referred to the way this reduces effective communication, especially when talking to elderly individuals who are hard of hearing. Interestingly, however, this was also flagged by respondents who described how "*you don't realise how much lip reading happens until your mouth is covered*", and how, when use of facemasks commenced they realised that they were not understanding because they "*lip read a lot out of habit*".

Equally important in the data is the theme related to the reduced ability to read emotions and facial body language, with 17% of the reasons given in the responses describing how they found it harder to communicate when unable to read facial expressions "*you can never fully read the emotion on someone's reaction*".

A very small proportion of the respondents flagged issues related to wearing the mask itself, which physically interfered with their speech because of the heat and discomfort associated with it, or the misting up of spectacles. One described how they were impacted by the "*hot air whilst talking and mask sucks back into mouth*" or the "*mask moving in and out*". An equally small proportion described how their own state of anxiety linked to having to wear the mask impacts badly on communication, with one respondent describing how "*I don't communicate well when I wear a mask as it makes me nervous/frustrated*". The responses within this theme highlighted issues related to anxiety and breathlessness and a feeling of "*less oxygen, less breathing, less recognition of the partner or the situation you are in*".

4.6 Impact of Face Masks at Work

A total of 592 respondents (60% of sample) indicated that they wear a mask at work , with 65% of these saying they do so for long periods of time, or constantly. Of these, 302 respondents indicated that wearing a mask at work always, or sometimes, impacts on their performance. 286 individuals chose to offer qualitative details, out of which 6 respondents gave a positive answer, claiming that it makes them feel more secure and confident in doing their job, as they feel protected. The other 280 respondents claimed that the mask impacts their work in a negative way.

The most common response amongst those who answered this question was that the mask limits effective communication. A total of 143 respondents (50% of those who responded to this question) feel that they cannot do their job effectively whilst wearing a mask as they claim that it hinders communication. Difficulty with projecting one's voice, difficulty with properly hearing and understanding what colleagues, students, clients or customers say and the loss of nonverbal communication through facial expressions were the three key issues which participants flagged.

A few participants mentioned that the inability to communicate effectively impacts their mental wellbeing as they end up feeling isolated with one respondent claiming that "*it creates a sense of isolation, a restricted freedom*". Participants also mentioned that masks not only impede communication, but might also lead to miscommunication. Some participants mentioned that the masks restrict them from appearing warm in their customer-oriented jobs and they feel that they often can-

Q32	Frequency of code	%
Poor voice projection/clarity of speech	468	49.1
Can't see facial expressions/read emotions	164	17.2
Can't read lips/cant see mouth	155	16.3
Not being understood/understanding others	125	13.1
Out of breath/anxious/too hot	14	1.5
Discomfort of mask/steamed up specs	13	1.4
Problems when communicating in a foreign language	7	0.7
Other	7	0.7
Total	953	100.00

Table 8: Qualitative data from Q32: What is the main problem with communication when wearing a mask?

not provide a satisfactory customer experience whilst wearing a mask, claiming that the mask "*makes [them] feel like [they] give a colder service*".

Several respondents who mentioned communication in their responses work in education and argued that the process of teaching and learning is not as effective when wearing masks particularly since masks cover facial expressions which are imperative to understanding the effectiveness of pedagogy. Furthermore, educators also mentioned that they feel uncomfortable about the fact that their students cannot read their expressions, as this makes the student-teacher relationship detached and less personal.

The second most common impact of mask-wearing on the experience of work as mentioned by the participants was the lack of concentration due to discomfort. 83 respondents (29% of those who answered the question) claimed that mask-wearing at their workplace creates discomfort leading to nervousness, irritability and thus to a decrease in concentration. A sense of suffocation, foggy glasses, heat and fatigue were the key discomforts mentioned by participants. Some participants (14) claimed that they feel that they inhale less oxygen whilst wearing a mask for a long duration and thus often end up feeling suffocated and develop other physical discomforts which limit concentration, such as dizziness, nausea, headache and sore or dry throat.

Another 14 participants mentioned that condensation is the main negative impact which the mask has on their work, as it leads to foggy glasses. "*Glasses get misty and can't see properly. [It is] not always comfortable and hence tend to take it off when on my own*".

It is concluded that a lack of effective communication and a lack of concentration caused by discomfort are the two main impacts which masks have on the participants' work.

5 Discussion and Conclusion

The practice of wearing facemasks is a core element in Malta's public health campaign to counter the local spread of SARS-CoV-2. Its level of efficacy is dependent on societal compliance and, though legal sanctions no doubt play an important part, individual and shared beliefs and attitudes related to the wearing of face coverings are also key drivers of behaviour in this regard.

Our data, collected before the wearing of face coverings was mandatory, show how the vast majority of participants within our non-probability sample chose to wear them, with the predominant choice being facemasks. The minority who declared they did not wear masks justified this by questioning the usefulness of wearing a mask in the first place, with a handful of individuals going as far as questioning the existence of a pandemic at all. Some pointed out that most of the time they are not worn as they should, and not washed as often as they should be, in order to be effective. This cynical perspective is also evident, though marginally so, when respondents described how they felt when people around them wore masks, with a very small minority claiming that they "*do more harm than good*" and make people look ridiculous.

Data from the overwhelming majority of respondents, however, strongly demonstrate that the wearing of face masks while interacting in public spaces (both indoor and outdoor) leads to a sense of security, with increased sense of confidence in public safety measures. More interesting from a relational perspective is the flagging of a sense of reciprocal respect and community solidarity that results from the wearing of masks in public. The obverse of this is also evident in our data with the vast majority (71%) of respondents flagging the way they are annoyed by individuals wearing their mask incorrectly. 23% went as far as saying that this increased their level

of anxiety, and, as would be expected, this was highest in the respondents who self identified as vulnerable to COVID-19.

There are two areas of interest that emerged in the data related to knowledge and beliefs. The first is the mistaken belief that a visor offers as much protection as a facemask, with this ironically being most evident in the vulnerable 65-74 age group. The evidence that use of visors without a mask does not offer efficient protection has since become well established (Salimnia et al., 2021; Verma et al., 2020). The mistaken belief that emerged in our data may now be less of a concern locally as public health messages that have been launched intending to correct this have probably taken effect. The second area of interest, however, is more predominant and potentially leads to non-compliance in the wearing of a facemask, or anxiety when indeed wearing one. This is the evidently strongly ingrained belief that wearing a facemask reduces the amount of oxygen available to breathe. Our data show that 53% of participants believe that this is, or may be, true. The fact that our data show more accurate beliefs are related to higher levels of education is not an unexpected finding, however this, in itself, flags the need for more effective science communication in the public domain.

Our data related to the lived experience of wearing a mask strongly indicate a negative impact on everyday experience. The fact that data were collected when the average for peak daytime temperature was 26 degrees celsius makes all the qualitative data on hardships related to excessive heat very predictable. The same applies to the problems flagged with wearing masks during exercise, or the physical irritations due to the tight covering over the mouth, and consequent issues of misting up on spectacle lenses. More interesting are the data about individuals feeling that it is harder to breathe with a mask on, with more women than men claiming this to be the case, with it being up as high as 50% of all women in the 55–64 age group. There are qualitative data which offer a possible explanation for this, with participants highlighting the problematic impact of menopausal hot flushes in this scenario, a finding that dovetails with the quantitative data from the 55–64 year old female respondents described above. Another finding with possible important implications on non-compliance to public health recommendations and increased risk of SARS-CoV-2 transmission, is the fact that 11% of respondents who offered qualitative detail on situations where they feel it is harder to breathe with a mask on ($n = 416$) mentioned enclosed, small spaces such as lifts, cars, buses etc.—all areas where risk of transmission by droplet infection is high. This is another scenario that warrants careful and effective science communication to redress.

Both quantitative and qualitative data presented above highlight the negative effect on quality of everyday social interaction and communication that the use of face masks entails. Besides this issue being raised by the elderly and individuals with hearing impairments in the sample, it is also interesting to flag how people with no such disability also reported that they had difficulty comprehending individuals speaking while wearing a mask, with frequent remarks in the qualitative data about being surprised at how much they relied on lip reading in normal everyday situations. The input from individuals describing how the challenges related to speaking a foreign language from behind a mask are also important to flag, where they described increasing problems because of their pronunciation and decreased opportunity for using facial expressions.

These challenges related to communication, heat, discomfort, anxiety about lack of oxygen, finding it harder to breathe, besides the more mundane issue related to condensation on spectacles, all have a negative impact on the experiences of participants who wear masks at work. Half of respondents offering data in this section ($n = 286$) flagged barriers to communication as the key problematic impact of wearing face masks at work, with others (29%) describing how it increased their level of irritability and reduced their level of concentration and the quality of the service they offered.

These findings, based on data drawn from a convenience, non-probability sample ($n = 990$) in the Maltese context are not intended to flag any generalisable conclusions. Though overall compliance to public health directives is clearly dominant within our sample, our data offer a better understanding of the social processes impacting, and impacted by, the wearing of face coverings in the COVID-19 pandemic scenario. The findings, in particular those highlighting lay epidemiology rooted in mistaken beliefs, barriers in communication, and the subjective description of anxiety levels and discomfort, may serve as a contingent lens to identify areas of potential breakdown of safe practices where focused science communication would be beneficial in the general arena.

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